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COOPERATIVE DISTRIBUTION OF NEW SMYRNA FIGS AND CAPRIFIGS.

INTRODUCTION.

The best dried figs are of the Smyrna type and can be grown only along with a certain small proportion of male trees (caprifigs), from which the pollen must be carried to the young fruits of the edible fig by the fig insect (Blastophaga). Smyrna figs and caprifigs were introduced into California as early as 1880 by Mr. G. P. Rixford, but the Blastophaga necessary to carry the pollen from the one to the other was not available in this country until the spring of 1899, when it was sent from Algiers by the writer and established in the caprifig trees in Mr. George C. Roeding's orchard at Fresno, Cal.[1]

CAPRIFICATION.

Male fig trees bear abundant fruits in the spring, called "profichi" (pronounced *pro-fee'-kee*). These profichi ripen in June or July (depending on the climate) and are then gathered, strung in chaplets, and suspended from the branches of the Smyrna fig trees. The Blastophagas thereupon escape, getting dusted all over with pollen as they are crawling out from a ring of male flowers situated just inside the mouth of the caprifig. They fly about the Smyrna trees and enter the young fruits, carrying in pollen enough to fertilize the many flowers they contain. The operation of suspending the profichi in the branches of the Smyrna fig tree is called "caprification" and is absolutely necessary before a crop of figs of the Smyrna type can be secured. One caprifig tree will furnish enough profichi to caprify 50 or more Smyrna fig trees.

[1] Recent investigations have shown that the Blastophaga has existed more than forty years on a single caprifig tree located in a stock-raising section of the San Joaquin Valley, west of Modesto, Cal., but the nature and the utility of the insect were alike unknown to the owner of the tree, and owing to its remoteness from other fig orchards the Blastophaga never spread to other caprifig trees. The effective introduction of the fig insect remains, therefore, that made from North Africa in 1899.

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SEVERAL VARIETIES OF CAPRIFIGS MUST BE GROWN.

It would be a mistake, however, to suppose that one caprifig tree of a variety yielding good profichi will suffice for 50 Smyrna fig trees. In order to maintain the Blastophaga throughout the year a number of distinct varieties of caprifigs are necessary, some adapted to carry the fig insect through the summer and others able to tide it over the winter. It must be remembered that the Blastophaga can live only in the fruits of the caprifig tree and that any one variety of caprifig is likely to have "off" seasons, when it bears few or no fruits. At such times there must be other varieties of caprifigs growing near by in which the insects can breed without suffering any serious diminution in numbers.

In the present state of our knowledge and experience the only safe course for the fig grower to pursue is to plant out for each 50 Smyrna fig trees one standard caprifig tree of a variety known to yield good profichi, and then to plant in one corner of the orchard as many varieties of caprifigs as he can secure and can find room for. These extra caprifigs may be planted more thickly than the rest of the orchard, thus assisting one another in carrying the insect from generation to generation.

NUMEROUS VARIETIES OF CAPRIFIGS DISTRIBUTED FREE.

For some years past the Bureau of Plant Industry has been introducing the best varieties of caprifigs from the fig-growing districts of the Old World. These caprifigs are largely from North Africa and southern Italy, regions where caprification has been practiced since ancient times. Among them are many promising sorts that should be in the caprifig orchard of every Smyrna fig grower. As caprifigs have nowhere been bred systematically, valuable new varieties, which arise as chance seedlings, are as likely to originate in Algeria or in Naples as in the districts in Asia Minor devoted to the commercial culture of the best Smyrna figs. These caprifigs are growing in the plant-introduction garden at Chico, Cal., and rooted cuttings of many of the best sorts are now ready to be sent free of cost to anyone who will agree to plant out and care for three seedling figs (also furnished free) for every cutting received.

SEEDLING FIGS YIELD VALUABLE NEW FIGS AND CAPRIFIGS.

In 1886 and 1887 Mr. E. W. Maslin set out at Loomis, Placer County, Cal., some 153 1-year-old fig trees grown from seeds of the best imported Smyrna figs. Out of these trees 139 are now in bearing, 74 being caprifigs (male trees) and 65 Smyrna figs—that is, figs of the Smyrna type, which do not set fruit unless caprified. Among Mr. Maslin's seedling caprifigs there are fully a dozen valuable new varieties, some of them unequaled by any that have been imported from the best fig-growing regions of Europe, North Africa, or Asia Minor. This orchard has been leased by the Bureau of Plant Industry of the United States Department of Agriculture, and these caprifigs are now available for free distribution in the form of cuttings (some of them rooted, some not) on the same terms as those described in the preceding paragraph.

A NEW TYPE OF DRYING FIGS.

Several of the new varieties of edible figs in the Maslin orchard are of decided promise, and at least two of them show a valuable characteristic not noticed in any of the drying figs that have been introduced from the Old World. These two varieties as grown on the warm granitic soil of Loomis at 475 feet elevation and without irrigation show a tendency to seal up the mouth of the fig as it ripens by the gradual hardening of a drop of pellucid gum. The first of these self-sealed varieties is the Rixford, which is a medium-sized, thin-skinned fig with light amber-colored pulp of good flavor. As they ripen a considerable proportion of the fruits become hermetically sealed. No filth, beetles, or other insects can get into such figs, and they do not sour, for the simple reason that the germs that cause fermentation are also excluded. The tree is of immense size and is very fruitful. A dried fig of this variety is shown in figure 1.

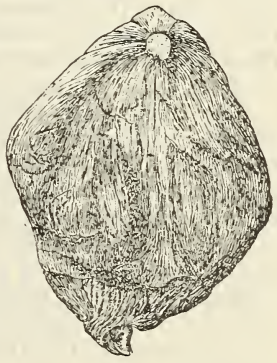

FIG. 1.—A dried Rixford fig of the shape best adapted for packing flat, showing the self-sealing device. Natural size. (Photograph by Elsen and Bruguiere.)

At Loomis some years from three-fourths to nine-tenths of the Rixford figs were self-sealed, while in other years the proportion has been only 25 per cent. If this variety continues to yield such fruit, it would be easy put on the market a special brand of figs guaranteed clean without and within," which, with a word of explanation about the self-sealing feature, should make this variety bring a fancy price.

Another variety with the self-sealing tendency was discovered late in October, 1908, after two soaking rains had spoiled the figs on the adjoining trees without injuring those of the self-sealed sort. This fig, in addition to the self-sealing feature, is a variety of great merit. It is of good size, exceedingly thin skinned, and by many pronounced superior in sweetness and flavor to the Lob Ingir itself. Cuttings of both varieties are offered free to all who will plant three seedling fig trees for every cutting received.

SMYRNA FIGS NOT HIGHLY BRED FRUITS.

It is clear from the results of Mr. Maslin's interesting experiment that Smyrna figs are not in a highly bred condition. Among the seedlings about one in ten of the Smyrnas is a valuable new variety deserving of careful trial for commercial culture, and among the caprifigs fully one in five is worth planting in the caprifig corner of a Smyrna fig orchard. The famous Lob Ingir fig is doubtless a chance seedling itself that originated perhaps many centuries ago near Smyrna (Aidin), in Asia Minor. The grower who plants seedlings of this and other good varieties stands a chance of originating new sorts equal to or even exceeding the parent variety in excellence.

DISTRIBUTION OF YOUNG SEEDLING FIGS.

In order to encourage the breeding of new and superior varieties of figs and caprifigs the Department of Agriculture continues to grow for free distribution thousands of seedlings from the seed of the best

dried figs, including the Lob Ingir (Bulletin Smyrna or Calimyrna) and the Rixford. These seedlings are now mostly 1 year old and are pot-grown plants ready to set out in the best condition to strike root at once.

The seedlings should be set 25 by 8½ feet or 30 by 10 feet apart, the former distance giving 209 and the latter 144 plants to the acre. Not over one-third of the seedlings will be of enough value to be worth keeping for further study, and two-thirds of the trees can be destroyed as soon as they come into bearing. Not all of the remaining third will be of value, but the inferior varieties can gradually be grafted over to the best of the new sorts.

Mr. Maslin's seedlings made an astonishingly rapid growth, although they were not irrigated. Three years after setting out in the orchard (four years from the seed) the trees were from 10 to 15 feet high and had trunks from 4 to 6 inches in diameter. Some of these seedlings bore fruit two years after being set out, and many of them when set three years.

For every three seedlings set out, as previously suggested, one rooted cutting of an imported caprifig or one nonrooted cutting of one of the new figs or caprifigs originated in the Maslin seedling fig orchard will be sent free of all expense. Those taking advantage of this offer will be considered as cooperating with the Department of Agriculture in the fig-breeding work and will be given the preference in the distribution of any new varieties introduced from abroad or originated through breeding by the Bureau of Plant Industry. They will also receive free of cost, as cooperators, all publications issued in the future by the Department on fig culture or fig varieties.

CONDITIONS UNDER WHICH FIG SEEDLINGS AND CUTTINGS ARE DISTRIBUTED.

The only condition attached to the offer here made is that, in order to keep straight the nomenclature of the many new varieties that are likely to arise, the growers agree, first, to allow properly accredited agents of the Department of Agriculture access to the plantations; second, to send sample fruits (at no expense to him) from any or all of the seedling trees; and, third, not to distribute any of the new varieties until they have been named by the Department, it being understood that the names proposed by the grower will be adopted if in accordance with the rules of the American Pomological Society. The varieties thus named become the property of the grower on the understanding that he sends (at no expense to him) five good cuttings for trial in the several experimental fig orchards of the Department of Agriculture. The conditions as mentioned above have been printed in the form of an agreement on the card herewith inclosed, marked "Application for Smyrna fig and caprifig cuttings and seedling figs," which is to be signed and returned if any plants are desired.

FOOTHILL REGIONS LIKELY TO PRODUCE THE BEST DRIED FIGS.

The best flavored and thinnest skinned Smyrna figs come from the foothills bordering the Meander Valley, in Asia Minor. So far no Smyrna figs have been produced in California as thin skinned as the best imported grades.

It is believed that the climatic and soil conditions of certain foothill regions favor the production of thin-skinned figs, and it is hoped to find such localities on the mountain slopes in California, and possibly also in some parts of Arizona and Texas. It will be necessary to determine by trial the best locations for growing first-class figs. At low elevations the summers are too hot and dry to permit the fruit to remain thin skinned; at high elevations there is danger that the season will be too short to mature Smyrna figs properly, owing to the diminished heat in summer and the earlier rains in the fall. The best grades of Smyrna figs, wherever they could be produced, should be a crop particularly well adapted for culture in foothill regions, especially those remote from railways, since dried figs have a high value for their bulk and weight and, unlike fresh fruits, can be hauled long distances to market without injury and with small freight charges.

SPECIAL FIG COLLECTION OFFERED TO FOOTHILL GROWERS.

In order to encourage the trial on a small scale of Smyrna figs in as many regions as possible in the foothills of California, Arizona, and possibly Texas, the Department of Agriculture offers a collection consisting of two cuttings each of at least three varieties of Smyrna figs (including the Lob Ingir and the Rixford) and at least four caprifig varieties (one variety to be in the form of rooted cuttings) on condition that ten seedling figs be set out. It is hoped that many will avail themselves of this offer, which can be done by signing and returning the inclosed card marked "Application for special Smyrna fig collection for foothill regions and coastal valleys."

At high elevations in the foothills, where the Smyrna fig crop is liable to be spoiled by rains beginning early in the fall, it is believed that there is more hope of succeeding with self-sealing varieties like the Rixford, the fruits of which when nearly cured can withstand uninjured a soaking rain. For this reason seedlings of the Rixford, so far as available, will be sent to applicants living at high altitudes, in the hope that some of them, while showing the self-sealing feature developed as much as or even more than in the parent variety, may also ripen earlier.

COOL COASTAL VALLEYS MAY PRODUCE THIN-SKINNED SMYRNA FIGS.

The coastal valleys of California have cool summers because of the cold winds and fogs that blow in from the Pacific Ocean. Some of these valleys, especially in the fog belt near the ocean, are too cold to permit Smyrna figs to ripen and cure properly, but in other valleys, and particularly in warm exposures in the low foothills, it is probable that thin-skinned Smyrna figs could be produced.

In order to encourage the testing of Smyrna figs on a small scale in such situations, the special collection for the foothills mentioned in the preceding paragraph will also be sent to applicants living in the coastal valleys where it appears that the summers are warm enough to give any hope of ripening figs of the Smyrna type. Any who desire to make such a trial of a few standard varieties, with the necessary caprifigs, should sign and return the inclosed card marked "Application for special Smyrna fig collection for foothill regions and coastal valleys."

COOPERATIVE CAPRIFIG AND SEEDLING FIG ORCHARDS.

Where a number of growers have small Smyrna fig orchards in the same region and when the best assortment of caprifigs to plant is yet to be determined, it would probably prove advantageous for the growers to club together and plant out a large seedling fig orchard and thereby secure for trial all the varieties of caprifigs offered by the Department of Agriculture. The seedling fig orchard would itself be an admirable breeding place for the Blastophaga in a few years, and meantime the best-known varieties of caprifigs would be undergoing trial. The best assortment of varieties of caprifigs for commercial orchard planting will probably have to be worked out by actual trial in each fig-growing section.

As a special inducement for the formation of such cooperative fig orchards the Department of Agriculture will give double the usual number of cuttings of each variety in case 200 or more seedlings are planted. This will give two cuttings for every three seedlings set out. This offer is made so that such associations will be sure to secure without delay good trees of as many different varieties as possible, and to favor the planting of large numbers of seedling figs.

A seedling fig orchard planted 25 by $8\frac{1}{3}$ feet and covering $1\frac{1}{2}$ acres would contain 310 trees and would entitle the association to 206 cuttings of figs and caprifigs. These latter, set 25 feet square, would cover another $1\frac{1}{2}$ acres, making the total area to plant 3 acres.

CAPRIFIG FRUITS FROM THE MASLIN ORCHARD GIVEN TO COOPERATORS.

When a Smyrna fig orchard is planted out the caprifig trees do not come into full bearing as soon as the Smyrna trees, and may not be able to carry the Blastophagas through the first winters. In order to provide supplies of mamme (winter caprifigs) needed to stock the caprifig trees with Blastophaga in the spring and of profichi needed to caprify the Smyrna crop in June the Department of Agriculture will put the caprifig crop of the Maslin orchard, for the present at least, at the disposal of the fig growers of the country.

At Loomis the profichi crop is ready for distribution from June 10 to 20, depending upon the weather. The caretaker of the Maslin orchard will ship the figs by express C. O. D. at the actual cost of picking and packing.

Cooperators who have planted out seedling figs will be given the preference in this distribution, and all such who anticipate that they will need profichi are requested to sign and return the inclosed card entitled "Application for caprifig fruits."

The need for planting an assortment of varieties in every Smyrna fig orchard will be in no way obviated by this opportunity to secure caprifigs from the Maslin orchard. In the first place, this offer is a temporary one and, in the second place, there will probably be so much demand for cuttings from the best varieties of caprifigs growing in the orchard that these trees may be cut back so severely that only small crops will be produced.

OUTLOOK FOR SMYRNA FIG CULTURE ENCOURAGING.

This country imports annually about 2,000 tons of Smyrna figs, worth some three-quarters of a million dollars. We produce at home only about one-half this quantity, so there is no present danger of

overproduction. It will remain a standing reproach to our fruit growers as long as this condition of affairs continues and we keep on sending to Turkey for what we could and should grow at home.

It is to be earnestly hoped that no uncertainty will linger in the minds of the Smyrna fig growers as to the possibility of growing cheaply an abundant supply of profichi for use in the caprification of Smyrna figs, or regarding the determination of the Department of Agriculture to furnish profichi to all who are making a reasonable effort to supply their own needs.

To dig up or graft over a Smyrna fig orchard just coming into bearing because of doubts as to the possibility of securing an adequate supply of profichi is to commit horticultural suicide. It is to be hoped that this circular will reassure any who may have contemplated such a step unfortunately taken irrevocably by many fig growers in California within the past two years.

WALTER T. SWINGLE,
Physiologist in Charge.

Approved:
B. T. GALLOWAY,
Chief of Bureau.

DECEMBER 13, 1909.

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